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ABSTRACT

A study tested the ability of 40 students at Ohio University, 20 Americans and 20 Chinese, to recall parts of nine news headlines flashed at them on pieces of paper. Students in communication subjects or linguistics were excluded as being too knowledgeable in communication theories. The hypothesis for the study stated that native Chinese speakers (character-based language users) have stronger recall of the overall meaning in headlines, compared to native English speakers (phonetic-based language users), who have stronger recall of names and proper nouns but not of the headline's overall meaning. Quantitatively, this hypothesis was not supported. However, in looking specifically at the number of headlines remembered and what was recalled, the hypothesis was supported. Furthermore, in general, women test subjects were more likely to give brief one-to-four-word recall responses, while men were more likely to remember longer passages. Overall, Chinese students tested had much stronger memories than American students tested. This experimental project is very relevant to international mass communication as more and more publications opt to publish several different language versions of the same edition. This not only requires keen translation, but also an understanding that the language a person speaks determines how that person perceives the world. Contains 37 references. (TB)

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LANGUAGE AND MEMORY:

IMPLICATIONS FOR MULTI-LINGUAL

INTERNATIONAL NEWS ORGANIZATIONS

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ABSTRACT

Phonetic-based languages are processed in the brain's left hemisphere, while character-based languages are processed in the right hemisphere. Research suggests that people reading a phonetic-based language will have better recall of names and proper nouns, while people reading a character-based language will have stronger recall of overall meaning. This paper reports the results tests given to English speakers and Chinese speakers on their recall of headlines presented in their native languages.

LANGUAGE AND MEMORY: IMPLICATIONS FOR MULTI-LINGUAL NEWS ORGANIZATIONS

STATEMENT OF THE PROBLEM

Several recent linguistic studies, notably Shimamura (1987), Fang, *et al* (1981) and Besner and Coltheart (1979) provide convincing evidence to support the hypothesis that character-based languages such as Chinese and Japanese are comprehended faster in the human brain than phonetic-based languages such as English and Russian (Tzeng and Hung, 124).

There are two explanations for this phenomenon. First, reading comprehension of characters involves two steps, while reading comprehension of a word written in an alphabet involves three steps (Wang 1974, 88). This will be explained in more detail later. Second, many psychological and neurological studies conducted in the past 30 years indicate that most language processing, including sign language and phonetic-based languages, occurs in the brain's left hemisphere, whereas languages that are character-based are processed in the brain's right hemisphere. Because character-based languages are read faster than phonetic-based languages Tzeng and Hung argue that people reading in characters have more rapid access to meaning of that which is being read, and people reading in alphabets have more rapid access to names and nouns (Tzeng and Hung, 124). From these findings, studies by Park and Arbuckle (1977), Turnage and McGinnies (1973), and Tzeng and Hung (1988) that look at memory and recall of written material show that people who read in characters have stronger memory and recall of overall meaning of what is read, and people who read in alphabets have stronger memory of names and proper nouns.

Unfortunately, little cross-disciplinary research has been done to apply linguistic theory to mass communication theory. This research project attempts to specifically test some of these linguistic theories on the memory and recall of newspaper headlines written in

Chinese and English by native speakers of these two languages. This is significant as more newspapers elect to publish multi-language editions that include English and Chinese, or other phonetic languages and logographic (character-based) languages. It is necessary to present news in the manner that is best remembered by readers. This paper indicates that editors responsible for news copy and headlines are translated must also consider cognition characteristics of a language along with general semantic differences in the writing process, as well as the translation process.

To understand the methodology of the research project described in this paper it is best to first look at the theories that support the hypothesis.

SUPPORTING RESEARCH

Wang, in his study of reading comprehension, was able to support the hypothesis that reading character-based script involves a two-step process, and that reading a phonetic-based script involves three steps (Wang 1974, 88). When a person reads a sentence written in characters he or she 1) visualizes (i.e., sees) the image, then, 2) understands the meaning of the sentence. When a person reads a sentence written in a phonetic language he or she 1) visualizes the image, then, 2) silently sounds out the words in the sentence, then, 3) understands the meaning of the sentence. A simple way of understanding this is to consider what happens when a person is driving and he or she sees a stop sign. The sign is so familiar that it is interpreted much like the picture image of a Chinese character. Studies show that drivers don't read or sound out the word "stop" on the sign, rather they see the image and it immediately is comprehended. So in this example, the second phase of reading comprehension is eliminated because the person is reading an image and not a phonetic word.

A year before Wang's study, Turnage and McGinnies in 1973 asked Chinese and American college students to study a 15-word list and to recall the order of the words in the list. However, they also

altered the test and re-administered it so the list was read aloud to each test group. They found that the Chinese students remembered more of the words and at a faster rate when the list was read aloud, compared to the visual presentations of the words. They found no difference in recall or the speed of recall between the list read aloud or the list presented in writing with the American students. One reason for these results given by Turnage and McGinnies is that Chinese characters contain more symbols (characters) with similar sounds but different meaning than the equivalent "symbols," or words in English.

Another study, conducted in 1977 by Park and Arbuckle, demonstrated that people who read and speak Japanese, where both characters (called Kanji) and a phonetic script (called Kana) are used in writing, have stronger recall of the Kanji character component than the Kana component. This was true in tests of recall where words were presented by reading them aloud and when they were presented in writing. Theorists believe this is due to the two-step cognition process of a character-based language.

The research that will be described in this paper concentrates solely on the research dealing with memory of the written word, and not the subsequent research that examines memory of text read aloud to a person as compared to memory of text that is read by a person. However, these latter linguistic studies are certainly worthy of testing their application to mass communications. For example, it would be interesting to study whether Chinese and English speakers best retain news that is written, presented over the radio, or presented on television. But this paper does not attempt to examine this aspect of the research.

The research project used as the model for the research described in this paper was conducted by Tzeng and Hung in the mid-1980s and built on the research described above on memory of written versus spoken language. Tzeng and Hung decided to conduct a finer analysis of these theories by once again testing native English speakers and native Chinese speakers who were literate in their native languages. This was a test of the subjects' ability to recall a series of words, as well as their memory of the specific words

presented separate from the order in which they were presented (Lui *et al* 1988, 126). Their methodology was to present a series of nine slides that each projected a single word. Each test group was given three seconds to read each slide and immediately following the presentation they were ask to write down the nine words in the order they were presented. A second set of nine words similar in difficulty was read aloud to the two test groups in their native languages, and again they were asked to recall the words in the order they were presented.

Tzeng and Hung concluded that the English speakers recalled names more easily, while the Chinese speakers recalled words representing a broader meaning, such as "tradition" or "feel" than their English-speaking counterparts. The Chinese had stronger recall of the words in writing, while the Americans had stronger recall of words read aloud (Liu *et al* 1988, 127). This challenged Turnage and McGinnies' research that showed no significant difference between English-speakers recall of material read aloud or presented in writing.

The methodology used in Tzeng and Hung's study served as the model for the research project outlined in this paper.

HYPOTHESIS

The experiments conducted for this project were designed to test the following hypothesis: Native Chinese speakers have stronger recall of the overall meaning in headlines, compared to native English speakers who have stronger recall of names and proper nouns, but not of the headlines' overall meaning.

METHODOLOGY

To test this hypothesis 40 students from Ohio University were asked to participate in the experiment. Twenty of these students were from Taiwan and spoke the Mandarin dialect of Chinese as their

native language. The other 20 students were Americans who spoke English as their native language. All the Chinese subjects were bilingual in Chinese and English, however 11 had lived in the United States for three months or less and they were not as experienced in speaking and reading English on a daily basis. The other nine Chinese students' time in the U.S. ranged from four months to two years, with the average stay being nine months.

Upon the advice of Dr. Neil Anderson, a professor of linguistics at Ohio University who reviewed the proposed methodology, students majoring in mass communications, interpersonal communication, linguistics, or international relations were excluded as test subjects. The reason being that students with these majors would have more knowledge of newspapers and communication theories, which may have given them superior recall of headlines and thus invalidated the experiment.

In both test groups approximately 25 percent of the students were in graduate studies and 75 percent were undergraduate students. A wide range of majors was also represented in both groups, including electrical engineering, mathematics, psychology, communication systems management, pre-medicine, English, sociology, history, and sports administration, to name a few. Also, roughly 50 percent of the subjects in both groups were men and 50 percent were women.

After selecting the test subjects, who were all volunteers, two separate testing dates were assigned to test the Chinese students together and to test the English students as a whole. Tzeng and Hung's portion of research comparing recall of words read aloud was dropped from the research design. The test administered dealt solely with printed headlines. Two modifications were made in modeling the test on Tzeng and Hung's research. First, instead of flashing the series of nine headlines on a screen from a slide projector, the headlines were presented with each headline printed on a separate sheet of paper. They were then stapled together and given to the student to read. This choice of presenting the stimulus data was to best mimic how headlines are read in a newspaper. Needless to say, people do not read headlines from a slide projector.

Second, the time permitted for subjects to read each headline was five seconds, as opposed to Tzeng and Hung's three-second interval between words. This was simply because it takes longer to read a headline than one word. Also, research in the time it takes to read headlines indicates the average reader scans a headline in less than three seconds, however, since several headlines were presented the students were given the extra two seconds to read each headline.

The headlines selected were culturally neutral so as not to present news that might be more familiar to Americans or Taiwanese. None of the headlines dealt specifically with news events in the United States, the People's Republic of China or Taiwan. The headlines were taken from two sources, both Chinese-language daily newspapers: 1) Sing Tao Daily (western edition), and, 2) China Daily News.

Sing Tao Daily is a newspaper targeted to Chinese who live abroad and the western edition is published out of San Francisco. The China Daily News is published in Taipei, Taiwan, and has all of Taiwan as its target audience. The headlines were presented in Chinese to the Taiwanese subjects. A translation of the headlines into similar English headlines were presented to the American subjects. The translations were done by two doctoral students of journalism at Ohio University, E. E. Chang and Virginia Mansfield-Richardson, and by Shih-wei Fang, who has a master degree of journalism from Ohio University, and who is now working on a master degree in telecommunicaitons at O.U. However, two students from Beijing, two students from Hong Kong, and one other student from Taiwan were asked to evaluate the translations of the headlines which resulted in some revisions.

One thing learned from putting together the headlines was that even though speakers of all Chinese dialects--including Mandarin, Cantonese and Taiwanese--use the same characters, headlines are often written differently for those varying dialects. This is mainly because modern terms and proper names are written by using characters that sound like the name said in the respective dialect. Therefore, a name like *Yeltsin* may use characters that read (in Pinyin, the romanization system for Chinese) *Yu Lat Sen* in the

Mainland China Mandarin dialect (used for most newspapers in China), but *Yẹn Lu San* for the Cantonese dialect used in Hong Kong newspapers. Hopefully, this explains why all the Chinese students had to come from a similar region, as well as why the two newspapers were used in selecting appropriate headlines.

As stated earlier, in following the methodology of Tzeng and Hung's research, nine headlines were used and were presented in the same order to all test subjects. The headlines were chosen to represent a mix of simple and complex meaning, different subject matter, a mix of proper names, proper nouns and other parts of speech, and a mix of news from various regions of the world. Two of the headlines contained numerals to test how well the two groups remembered numbers. In 1979 Tong conducted research that suggests, due the nature of Chinese semantics, people who speak Chinese are better able to remember numbers compared to English speakers. This, Tong argues, is because Chinese is more mathematical in structure than English. For example, the Chinese equivalent of "twenty" is "two ten," and "thirty" is "three ten," and so on all the way into the thousands (Tong 1979, 39).

Here are the headlines used in the test in the order they were presented to the students:

1. **AIDS Cases in Brazil Rank Third in the World**

2. **London's Stock Market Hits New High in Heavy Trading**
   Canadian Trading Remains Light

3. **President Ndadaye of Burundi is Killed**

4. **Asia's Nuclear Power Future is Bright**
   Demand Will Increase in Next 10 Years

5. **IRA Plants Bomb That Injures 68 People**

6. **Russian Information Minister Resigns,
Cites Assembly Control of Mass Media
Yeltsin Requests Assembiy Elections
Be Held Sooner Than Planned**

7. **United Nations Reinstates Sanctions Against Haiti
As Gen. Aristide Refuses to Step Down**

8. **Bhutto Defeats Sharif to Become
Prime Minister of Pakistan**

9. **Two Sides in Bosnian War
Begin to Exchange POWs**

The headline on Burundi was selected specifically for its difficulty with both the name and the familiarity of Burundi. In the Chinese version of the Bhutto headline only the first name of Benazir Bhutto was used. Translator E.E. Chang explained, "In Chinese headlines sometimes you will only see the first name." However, in the Russian Assembly headline the last name Yeltsin was used. Ms. Chang said often more familiar names in the news are referred to by just the last name in headlines.

When the tests were administered students were only told that it was a test of memory and recall. They were also told that they would be asked to read a series of nine headlines and they would be asked to recall them in the order presented to the best of their ability. Finally, they were told if they could only remember bits and pieces to write down whatever they recalled. The Chinese students were given instructions in Chinese and they wrote their answers in Chinese. Likewise, the American students received all their instructions in English and their responses were written in English. The students were not permitted to look at the headlines after they read them, and they were not permitted to talk to other students participating in the test.

After they completed the test, each student was asked to fill out a questionnaire to find out some demographic and psychographic information about that person (see Appendices A and B). Beyond basic questions such as age, sex and major, students were also asked

about their newspaper reading habits. For example, they were asked: 1) how often they read a newspaper, 2) what newspapers they read regularly, 3) on the average, how much time they devoted to reading a single issue of a newspaper, and 4) what type of news they liked to read. In addition, the Chinese students were asked questions concerning how long they had studied English and how long they had lived in the United States.

After the 40 students were tested the results were analyzed both qualitatively and quantitatively. The quantitative analysis, which coded the names, numbers, and some nouns recalled, was more scientific and, therefore, was more valid. The qualitative analysis, which assessed the student's ability to grasp the meaning of a headline, was more subjective.

To measure the proper names, numbers and some nouns recalled by the students the following words from the headlines were given one point each, and the total points added up for a score.

AIDS	Brazil	London
Canadian	Ndadaye	Burundi
Asia	Nuclear Power	
10 Years	IRA	Bomb
68 People	Russian	Information Minister
Assembly	Yeltsin	United Nations
Haiti	Aristide	Bhutto/Benazir
Sharif	Prime Minister	
Pakistan	Bosnian	POWs

So each student had the potential of scoring a total of 25 points, and each test group could score a total of 500 points. The range of individual scores for the Chinese students was 3 to 14, with the average score being 8, and the group collectively scoring 161. The range for the American students was 3 to 9, with the average score being 6, and the group scoring 124. Here are the actual results:

CHINESE STUDENTS

Total Points Scored	Number of Students With Each Score
3	1
5	1
6	6
7	2
8	2
9	3
10	2
12	1
14	2
TOTALS: 161 points	20 students

AMERICAN STUDENTS

Total Points Scored	Number of Students
3	1
4	3
5	4
6	3
7	4
8	2
9	3
TOTALS: 124 points	20 students

RESEARCH FINDINGS

In assessing the results quantitatively, it can be said that the Chinese students had better recall of proper names, numbers and certain nouns than the American students. It is interesting to examine how these words were recalled. In some cases, with both test groups, a word from one headline was mixed with words from other headlines. For example, one subject's recalled headline read, "President of some Asian country killed" (American student), and another read, "Elected prime minister of Brazil" (Chinese student). However, this happened in only five of 94 headlines (or portions of headlines) recalled by the Chinese students or approximately six percent of the total headlines recalled, and in only one of 79 headlines (or portions of headlines) recalled by the American students.

This admittedly basic coding and quantitative analysis of the data seems to indicate that the Chinese students had better recall of proper names, numbers and some nouns. In sheer number of words recalled, this is a valid finding. However, the hypothesis is supported when looking at overall meaning that was recalled by the students in each test group. To judge meaning, test administrator Virginia Mansfield-Richardson simply coded a recalled headline as grasping the overall meaning of the original headline if all the key elements were remembered. For example, in the first headline a person would have to remember that AIDS cases in Brazil were third highest in the world. So if a person missed the word "ranked" or if they substituted "among all nations" for the "in world," and if all the other information was correct, that person was given credit for grasping the overall meaning of the headline. Two other doctoral students were then asked if they agreed with Ms. Mansfield-Richardson's analysis of headlines recalled that grasped the meaning. In all the cases the full panel of three judges had to agree on the granting of "full meaning" to a recalled headline.

In this analysis, the American students had far more single-word recall for headlines and most often those words were proper names or nouns. Here are some examples of these types of recalls: (NOTE: all answers are taken verbatim from the test sheets)

Answer sheet #11 - Female advertising major:

1. AIDS cases
2. Bosnia
3. Aristide
4. President Ndadage?
5. Asia
6. Asia
7. Prime Minister
8. (blank)
9. (blank)

Answer sheet #17 - Female environmental health major:

1. AIDS cases
2. Bhutto beats Shariff
3. (blank)
4. Nayadyme
5. IRA bombs, kills 68 people
6. (blank)
7. (blank)
8. (blank)
9. Bosnia and POWs

Answer sheet #20 - Female psychology major:

1. AIDS cases higher
2. Russia
3. Bosnia
4. Shariff
5. Plants bomb that kills 68
6. Yeltsin
7. (blank)
8. (blank)
9. (blank)

With the American test group this pattern of mostly single-word recall was more common in women, although two men also answered in roughly the same pattern adding only a few more words, but not enough to assess meaning to the headlines.

It was far more likely for the Chinese students to recall the headlines with more meaning. However, many of the recalled headlines had several words (more on the average than the American students' headlines), but they fell short of being assessed as grasping the full meaning of the original headline. Only four respondents gave brief, choppy answers. Here are those responses:

Answer sheet #2 - Female business major:

1. AIDS cases in Brazil rank third in the world
2. Canadian stock market
3. United Nations
4. Bosnia
5. (blank)
6. (blank)
7. (blank)
8. (blank)
9. (blank)

Answer sheet #7 - female systems management major:

1. AIDS cases in Brazil rank third in the world
2. Nuclear power demanded, coming 10 years increase
3. Brazil
4. Yeltsin
5. Ben (for first part of Benazir)
6. (blank)
7. (blank)
8. (blank)
9. (blank)

Answer sheet #12 - female education major:

1. Brazil AIDS ranked third
2. Nuclear development
3. Russian election Sharif defeated
4. President was assassinated

5. London stock market
6. (blank)
7. (blank)
8. (blank)
9. (blank)

Answer sheet #16 - female math major:

1. AIDS cases in Brazil rank third in world
2. Canada
3. (blank)
4. (blank)
5. (blank)
6. (blank)
7. Elected Prime Minister of Brazil
8. United Nations
9. (blank)

With both the American and Chinese test subjects it was more common for brief, spotty headline recall to come from the women rather than the men. While this experiment is more concerned with differences and/or similarities between English speakers and Chinese speakers, the data was also analyzed according to sex to determine if this variable had any significant correlation. Using the same quantitative counting technique, here are the score breakdowns between men and women for recall of the 25 proper names, numbers, and nouns listed above:

AMERICAN WOMEN TEST SUBJECTS

Total Points Scored	Number of Students
4	2
5	2
6	2
7	3
TOTALS: 22 points	9 women

AMERICAN MEN TEST SUBJECTS

Total Points Scored	Number of Students
3	1
4	1
5	2
6	1
7	1
8	2
9	3
TOTALS: 42 points	11 men

CHINESE WOMEN TEST SUBJECTS

Total Points Scored	Number of Students
6	3
7	1
8	1
9	1
10	1
14	1
TOTALS: 54 points	8 women

CHINESE MEN TEST SUBJECTS

Total Points Scored	Number of Students
3	1
5	1
6	3
7	1
8	1
9	2
10	1
12	1
14	1
TOTALS: 83 points	12 men

While this data breakdown is interesting, no correlation to previous data sets can be drawn from this information.

There are several ways that this information can be analyzed, including a chi square, or breaking down the data by world regions to see which regional headlines were better recalled by the students.

For the purpose of this project, the hypothesis that native Chinese speakers have better recall of the overall meaning in headlines, and that native English speakers will have better recall of proper names and some nouns was supported when looking at how headlines were recalled, but in measuring specific words quantitatively, the hypothesis was rejected. Some conclusions from these tests will be discussed in the final section.

Some other interesting patterns that emerged from the test relate to the order in which the headlines were remembered, and which headlines were remembered by the most subjects. First, according to Shaffer and Shiffrin (1972) the final two segments in a series are recalled the most often, particularly in linguistic tests of

memory (Shaffer and Shiffrin 1972, 293). This is simply because these items in the series were the last to be observed by the person being tested so they are easier to remember. While, in this paper's experimentation, a large number of respondents remembered the final two headlines, the most common headline recalled was the first in the series. Here is a full breakdown of the headlines recalled by both test groups. This merely indicates how many students remembered any portion of a given headline. The headlines are listed in the order they were presented in the test.

Headline (No. & key words)	Americans	Chinese	TOTAL
1. Brazil AIDS	15	20	35
2. London stocks	6	16	22
3. Burundi assassination	4	2	6
4. Asia nuclear power	7	9	16
5. IRA bomb	12	4	16
6. Russian assembly	5	7	12
7. United Nations, Haiti	3	8	11
8. Bhutto, Pakistan	9	16	25
9. Bosnia POWs	14	7	21

It is difficult to assess why some headlines were easier to remember than others. Certainly it can be said that the Russian assembly and the London stocks headlines were longer and more complex than the other seven in the series. Also, one might speculate that Americans receive more news of IRA activities than do Asians simply because of proximity and ties to Europe by Americans. Likewise, India is closer to Taiwan than to the United States both physically and culturally. So it might be possible that the Chinese students recalled this headline better than the Americans because they followed the actual news event more closely.

CONCLUSIONS

This project attempted to apply linguistic theory to mass communications. Specifically, a study on memory and recall conducted by Tzeng and Hung was replicated in methodology and tailored to test people's ability to remember headlines they read in the daily newspaper. Two distinctly different language groups -- character-based and phonetic-based -- were also tested and analyzed as variables in the experimentation. The hypothesis stated that people who speak character-based languages would have better recall of the overall meaning of the headlines, while people who speak phonetic-based languages would have stronger recall of proper names and nouns. Quantitatively this hypothesis was not supported. However, in looking specifically at the number of headlines remembered and what was recalled, the hypothesis was supported.

In general, women test subjects were more likely to give brief one-to-four-word recall responses, while men were more likely to remember longer passages. Overall, Chinese students tested had much stronger memories than American students tested. The nature of character-based languages, which require a great deal of rote memorization to learn, may be a contributing factor in explaining why the Chinese students remembered more than the Americans. However, cultural differences between the two groups may also be a factor. In Chinese society, students are taught from a very young age to memorize as much as possible to acquire knowledge. Memorization is a teaching technique often used in Chinese schools. On the other hand, American students are rarely raised in an academic tradition of memorizing facts and passages. So they may simply not have developed the skill, and it may be unrelated to the differences between how Chinese language is processed in the brain's right hemisphere, compared to English which is processed in the brain's left hemisphere.

This experiment project is very relevant to international mass communication as more and more publications opt to publish several different language versions of the same edition. This not only requires keen translation, but also an understanding that the

language we speak determines how we perceive the world. This is the basic tenant of semantics, which is the study of the meaning in language. Future studies in this area could look at the best ways to get news to people of different language groups so that it is best remembered. If, for example, people who speak character-based languages have stronger recall of the written word over the spoken word, as suggested by Turnage and McGinnies and Shaffer and Shiffrin, then the most successful news organizations in China, Korea and Japan would be television and radio news. So if a public information campaign was necessary the best avenues to making the message stick in the minds of the populous would also be radio and television.

This is just one example. Research such as the experiment reported on in this paper could also be applied to the advertising and public relations arenas of international mass communication.

Finally, there are several flaws in the research design and implementation of the test described in this paper. First, it is difficult to make all stimulus in a data set totally culturally neutral and any variance from neutrality taints the outcome of the experiment. Second, it is impossible to completely translate a headline from one language to another, so there will always be differing variables being measured which, again, decreases the validity of the test.

For example, in the course of designing this test of headline comprehension it was discovered that Chinese does not have separate words for "prime minister" and "president." So an American student who might lose credit for grasping the full meaning of a sentence because he or she calls a prime minister a president is unfairly penalized in comparison to his Chinese counterpart. Also in the course of researching this project, translator E.E. Chang explained that Chinese headlines are, as she said, "naturally poetic so they should be easier to remember than headlines written in English." She explained that editors for Chinese newspapers attempt to rhyme beginning and ending words, as well as match the number of characters in each line of a multi-deck headline to make it balanced and more readable. Ms. Chang argues that these qualities of Chinese

newspaper headlines also make them much easier to remember than headlines in English-language newspapers. So this is another tough variable to equal out between the two data sets. One of the most difficult aspects of testing comprehension in different languages is finding people who are fluent in both languages being compared, as well as knowledgeable in the grammar, syntax, and semantics of both languages.

Certainly the weakest area of this research project is the criteria established for determining what "meaning" is in a headline. In improving the research design, a larger panel of judges could be assembled to mull over each respondent's headline recall list to determine just how much meaning was remembered in each headline. It is possible to give a numeric ranking to meaning and evaluate the responses quantitatively, but it is equally valid to keep this area of analysis more open to general discussion on a qualitative level.

One reason more cross-disciplinary research is not conducted between linguistic and mass communication theory is because the two academes are equally rigorous and specialized, making it difficult to understand complex theories in each area. However, this should not discourage scholars from studying the connections between these two important fields that are so intricately tied to international communication.

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Questionnaire

Age: _____ Sex: Male Female (circle one)

Level of Education: undergraduate masters Ph.D. (circle one)

If undergraduate, what year are you in? _____

Undergraduate Major: _____

Graduate Major (if applicable): _____

How often do you read a newspaper? _____

_____

What newspapers do you read regularly?

_____

_____

_____

On an average, how much time do you devote to reading a single issue of a newspaper? _____

What type of news do you like to read (sports, entertainment, politics, etc.)? _____

(For native English speakers)

Questionnaire

Age: _____ Sex: Male Female (circle one)

Level of Education: undergraduate masters Ph.D. (circle one)

If undergraduate, what year are you in? _____

Undergraduate Major: _____

Graduate Major (if applicable): _____

How often do you read a newspaper? _____

_____

What newspapers do you read regularly (give Chinese or English name of newspapers and say what language it is printed in)?

_____

_____

_____

On an average, how much time do you devote to reading a single issue of a newspaper? _____

What type of news do you like to read (sports, entertainment, politics, etc.)? _____

How long have you lived in the United States? _____

How long have you studied English? _____

a. How many years have you studied English in China? _____

b. How long have you studied English in the United States? _____

_____

At what age did you start studying English? _____

(For native Chinese speakers)